IMPLANT LENS WITH BIARCUATE FIXATION

TECHNICAL FIELD

This invention relates to intraocular implant lenses and more particularly to a lens of light weight wherein the implanted weight is distributed over a large area to minimize the localization of support forces.

BACKGROUND ART

Lens implants on patients requiring surgery because of the presence of cataracts are widely practiced. Developments leading to acceptance of the technique and of lenses designed for implant are discussed in "A Lens For All Seasons" by Jerald L. Tennant, 1976. The development of the Choyce lens and the Tennant lens has lead to wide acceptance with many hundreds of implants being performed using such lenses. In such systems the lens is placed in the anterior chamber. Fixation of the lens is assured by four point contacts made by feet extending from the lens proper.

It has been found to be desirable to minimize the localization of the lens contact with the supporting tissues. Localized pressure by some prior art lenses has a tendency to cause distortion of the pupil after a period of time. Thus, the present invention is directed towards a lens suitable for implant in either the anterior chamber or the posterior chamber with minimal tissue loading.

DISCLOSURE OF THE INVENTION

In accordance with the present invention an intraocular implant lens unit is provided comprising a central lens structure having a narrow twelve o'clock limb and a narrow six o'clock limb integral with and extending radially from opposite margins of the lens. A narrow arcuate rim segment is centered on and is integral with the end of the twelve o'clock limb and extends for about the width of the optic. A narrow arcuate rim segment is centered on and is integral with the end of the six o'clock limb and extends for about twice the width of the optic. The arcs have a center at the center of the lens and are of diameter corresponding to the diameter of the chamber in which it is to be fitted so that the outer edges of the rim segments bear against the inner wall of the chamber.

DETAILED DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front view of an anterior chamber lens;
FIG. **2** is a side view of the lens of FIG. **1**;
FIG. **3** is a front view of a posterior chamber lens;
FIG. **4** is a side view of the lens of FIG. **3**; and
FIG. **5** illustrates the lens of FIGS. **3** and **4** mounted within the posterior capsule.

DETAILED DESCRIPTION

FIGURE 1

Referring to FIG. **1** an optic lens **10** of plano-convex shape is formed integrally with a six o'clock limb **11** and a twelve o'clock limb **12**. Limbs **11** and **12** thus extend diametrically in opposite directions from the lens **10**. A rim segment **13** is integral with and formed at the end of the limb **11** opposite lens **10**. The arc segment **13** spans an arc of about 60° and is of generally the same thickness and width as the limb **11**. It lies in the plane perpendicular to the axis of the lens **10** and presents a curved outer surface **13***a* which is preferably rounded on the edges and smooth to provide contact over the entire length of the surface **13***a* with the margin of the anterior chamber into which the lens is to be placed.

A second rim segment **14** is integrally formed with and is located at the end of the twelve o'clock limb **12**. The rim segment **14** preferably is of a chord length equal to the diameter of the lens **10**. It is much shorter than the rim segment **13** and is designed to engage along its outer surface **14***a* and the inner margin of the anterior chamber in which it is to be located.

In a typical embodiment, the lens **10** would have a diameter of 4 to 6 millimeters; thus, the chord length of the rim segment **14** would be 4 to 6 millimeters. The chord length of the rim segment **13** would be approximately twice the chord length of the rim segment **14**, i.e., 8 to 12 millimeters. Typically the radius of the outer surfaceS **13***a* and **14***a* of rim segments **13** and **14** would be of the order of 12.5 millimeters.

FIGURE 2

FIG. **2** is a side view of an embodiment of FIG. **1** wherein the lens **10** is plano-convex. It will be noted that the limbs **11** and **12** extend posteriorly relative to the posterior surface of lens **10** as well as radially.

It is to be noted that the implant unit of FIGS. **1** and **2** essentially retain the equivalent of four point fixation which prevents rotation of the lens. Rotation is also discouraged by having the long inferior rim. The inability to rotate is an important feature.

Corneal dystrophies of older triangular lenses such as known in the prior art occur primarily when the lens rotates in the eye causing continual endothelial cell damage. The weight of lenses currently used in greatest volume cannot be reduced by simply fenestrating the lens. Such expedients have been tried and found that the iris would herniate through the fenestrations. Further where point contact is made between a foot of a lens and the iris, there is a tendency to incarcerate the lens in the iris or in the ciliary body. Such incarceration is avoided with the lens shown in FIGS. **1** and **2** since the rim surfaces **13***a* and **14***a* have the same radius as the radius of the scleral spur.

By providing the limbs **11** and **12** with posterior inclination as well as radial extension, clearance of the iris of from $\frac{1}{2}$ to $\frac{3}{4}$ of a millimeter is provided to avoid rubbing of the iris tissue.

While the optic of FIGS. **1** and **2** has been shown as of plano-convex configuration it will be understood that it may be made convex-plano or biconvex. However, plano-convex configuration is preferred inasmuch as it provides maximum spacing between the iris and the posterior surface of the lens. Irritation in the postoperative period of the raw edges of the iris is thus avoided.

FIGURE 3

FIG. **3** illustrates a lens embodying the present invention suitable to be placed in the posterior chamber of an eye after an extra-capsular cataract extraction has been performed. It is not suitable, of course, for use after intracapsular extraction inasmuch as the capsule itself is used for fixation.

Referring to FIG. **3**, lens **20** is provided with radial limbs **21** and **22**. Limb **21** is integral at the end thereof with a rim segment **23** and has generally the same characteristics as above described in connection with FIG. **1**.

Similarly limb **22** terminates in and is integral with a shorter rim segment **24**. Rim segment **24** is pierced by a